

Climate change in Puget Sound and Georgia Basin 2005: Conference Session and Panel Discussion

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Climate change has gained world wide attention. Our science has concluded that global climate is changing (Intergovernmental Panel on Climate Change 2001: Houghton et al. 2001). Land, air and sea temperatures are climbing, the extent of snow and ice is declining, glaciers are melting, and recent extreme weather events, such as rainfall events, floods, drought and storms, have created and will continue to create extraordinary levels of damage to habitats, ecosystems, human communities, socio-economic systems, built environments (highways to hatcheries) and industry.

We can expect climate variation and change to continue at an accelerated rate with higher magnitude or frequencies of weather events and altered average climate conditions. Climate change and a trend towards global warming are expected to continue associated with higher levels of greenhouse gas emissions from human industry and development. Canadian and International Global Climate Models (GCM) (<http://www.cccma.bc.ec.gc.ca/models/models.shtml>) predict that global surface air temperature will increase on average by 1.3 to 5.8°C to 2100 relative to 1990 and that sea levels will rise 0.09 to 0.88m in Puget Sound and Georgia Strait. While many countries are working to reduce emissions (Kyoto Protocol <http://www.ec.gc.ca/climate/kyoto-e.html>), it is essential that we understand that climate warming and change are underway and will continue even if we meet objectives to reduce greenhouse gas emissions.

While mitigation will be important, it can only slow the rate of greenhouse gas accumulation and warming trends, but will not alter the direct and indirect impacts on the most sensitive portions of ecosystems including species productivity and distribution, habitats, biodiversity and species at risk. Adaptation, through use of innovative policy and management, is expected to assist ameliorate the affects of unexpected events and conditions associated with climate variation and change. Adaptation occurs as a proactive response to current exposure to climate change and development of solutions to future exposure and potential vulnerabilities (c.f. Smit and Pilifosova 2001, 2003). Adaptation science and research will help to identify anticipatory approaches for sustainable use and development of ecosystems and their component species and habitats. Present approaches of species, habitat and landscape management, conservation and protection of habitat, water and landscapes, Canada / US agreements and joint management in Puget Sound and Georgia Basin may not provide sufficient levels of conservation and protection to potentially vulnerable species, or currently productive species and landscapes given the predictions of future impact responses to climate variation and change. Recognizing the need to improve our knowledge of climate change impacts and adaptation, a Puget Sound / Georgia Basin 2005 conference session and panel titled "Climate Variation and Change in Puget Sound / Georgia Basin" was developed to provide a balance of existing and future regional research on the issues of climate change.

The PS/GB 2005 climate change session and panel discussion brought together 12 invited and contributed presentations to provide insight into a number of climate variation and change issues across Puget Sound and Georgia Basin. Presentations included: (1) prediction of future streamflow and rainfall in BC (Allamano, Cannon, **Whitefield**), (2) freshwater input and predictions into Puget Sound (**Mote**, Hamlet, Mantua), (3) regional downscaling of climate models (**Salathe**), (4) impacts of climate on salmon populations in southern BC (**Hyatt**), (5) adaptive management of urban water supply and distribution (**Vail**), (6) Seattle's water supply and climate change (**Wiley** and Palmer), (7) climate change and eelgrass distribution (**Thom**, Rourke, Sargeant, Borde), (8) St. of Georgia fish populations and ecosystem structures (**Preikshot**, Christensen, Beamish, Pauly), (9) metanalysis of climate change issues of Puget Sound / Georgia Basin (**Johannes**), (10) St. of Georgia and ocean variation (**Cummins** and Massan), (11) impacts

of climate on seal and herring production in BC (**Hay**, McCarter, Daniel and Therialut), and (12) climate impacts in Puget Sound ocean conditions (**Newton**, Bos, Albertson).

A panel discussion on climate variation and change was convened at the end of the conference session presentations. Panel members included: Jan Newton, Ron Thom, Tom Therriault and Patrick Communis and was moderated by Mark Johannes. The panel discussion explored the issues, opportunities and ideas needed to understand climate variation and change impacts in the PS/GB region and potential short and long term resource adaptation options.

The panel discussed a number of key questions about climate change in Puget Sound and the Georgia Basin including:

- In what ways are terrestrial and aquatic resources vulnerable to climate change in the Puget Sound / Georgia Basin?
- Will our existing management systems be able to accommodate the expected changes and in what species, communities, ecosystems and at what spatial and temporal scales?
- What scope do agencies and existing policies and management systems have to adapt to climate change?
- Identify policies and management systems that will be able to adapt and those that will need revision?
- What adaptation options to climate change are available for protection, conservation and management of terrestrial, aquatic and water resources?
- What are the most urgent questions for research and resource management now and during the coming decade?
- What is the role of science and what are the key contact points for science within societal response to climate change?

The panel agreed on the need for long term continued monitoring, transboundary resource management and future research incorporating interdisciplinary teams working on impact and adaptation responses to climate change. The panel's understanding of adaptation included: * an adjustment in practices, processes, or structures of systems to projected or actual changes of climate, * response to, or in anticipation of changes in condition, * actions taken to minimize the negative impacts of future climate changes and create new opportunities.

References

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